Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1-57. (Canceled)

58. (New) A communication method, sequentially comprising:

dividing each of a plurality of optical carrier signals into a plurality of intermediate signals, each optical carrier signal carrying all of a plurality of wavelength division multiplexed initial data signals, each intermediate signal carrying all of the multiplexed initial data signals over a predetermined wavelength range;

separating each intermediate signal into the respective data signals contained therein; and

combining corresponding data signals separated from the intermediate signals into their respective initial data signals.

59. (New) The method of claim 58, wherein dividing each optical carrier signal comprises:

passing each optical carrier signal through a respective first wavelength division multiplexer to divide the optical carrier signal into the plurality of intermediate signals.

60. (New) The method of claim 59, wherein separating each intermediate signal comprises:

passing each intermediate signal through a respective second wavelength division multiplexer to separate the intermediate signal into the respective data signals contained therein.

61. (New) The method of claim 60, wherein separating each intermediate signal further comprises:

passing each of the separated data signals to a predetermined delay line in accordance with its wavelength range.

62. (New) The method of claim 61, wherein combining corresponding data signals comprises:

combining all intermediate signals carrying the same data signal in the same wavelength range to form a single intermediate signal; and then

combining all single intermediate signals carrying the same data signal to form the respective initial data signal.

63. (New) The method of claim 62, wherein combining all intermediate signals carrying the same data signal comprises:

passing all intermediate signals carrying the same data signal through a respective third wavelength division multiplexer to combine into the respective single intermediate signal.

64. (New) The method of claim 63, wherein combining all single intermediate signals comprises:

passing all single intermediate signals carrying the same data signal through a respective fourth wavelength division multiplexer to combine into the respective initial data signal.

65. (New) The method of claim 64, wherein separating each intermediate signal further comprises:

passing each of the separated data signals to a predetermined delay line in accordance with its wavelength range.

66. (New) The method of claim 64, wherein at least one of the wavelength division multiplexers comprises an array waveguide grating.

67. (New) The method of claim 58, further comprising:

forming the plurality of optical carrier signals by wavelength division multiplexing all received initial data signals with each of a plurality of optical wavefronts.

68. (New) The method of claim 67, wherein forming the plurality of optical carrier signals further comprises:

receiving the initial data signals substantially simultaneously in a plurality of antenna elements as RF data signals.

69. (New) The method of claim 68, wherein forming the plurality of optical carrier signals further comprises:

generating an optical carrier wavefront at a unique, predetermined frequency for each initial data signal received.

70. (New) The method of claim 69, wherein each optical carrier wavefront comprises:

a plurality of carrier signals, each at the frequency of the respective carrier wavefront and having a different, predetermined phase.

71. (New) The method of claim 70, wherein forming the plurality of optical carrier signals further comprises:

mixing each received initial data signal from each antenna element with a respective carrier signal from each carrier wavefront to form the plurality of optical carrier signals.

72. (New) The method of claim 71, wherein at least one of the wavelength division multiplexers comprises an array waveguide grating.

73. (New) A communication method, sequentially comprising:

passing each of a plurality of optical carrier signals through a respective first wavelength division multiplexer to divide the optical carrier signal into a plurality of intermediate signals, each optical carrier signal carrying all of a plurality of wavelength division multiplexed initial data signals, each intermediate signal carrying all of the multiplexed initial data signals over a predetermined wavelength range;

passing each intermediate signal through a respective second wavelength division multiplexer to separate the intermediate signal into the respective data signals contained therein;

passing all intermediate signals carrying the same data signal through a respective third wavelength division multiplexer to combine to form a respective single intermediate signal; and then

passing all single intermediate signals carrying the same data signal through a respective fourth wavelength division multiplexer to combine to form the respective initial data signal.

74. (New) The method of claim 73, further comprising after separating each intermediate signal in the second second wavelength division multiplexers:

passing each of the separated data signals to a predetermined delay line in accordance with its wavelength range.

75. (New) The method of claim 74, wherein at least one of the wavelength division multiplexers comprises an array waveguide grating.

76. (New) The method of claim 73, further comprising:

passing the initial data signals through respective wavelength division multiplexers to form the plurality of optical carrier signals by wavelength division multiplexing all received initial data signals with each of a plurality of optical wavefronts.

77. (New) The method of claim 76, wherein forming the plurality of optical carrier signals further comprises:

receiving the initial data signals substantially simultaneously in a plurality of antenna elements as RF data signals.

78. (New) The method of claim 77, wherein forming the

plurality of optical carrier signals further comprises:

generating an optical carrier wavefront at a unique, predetermined frequency for each initial data signal received.

79. (New) The method of claim 78, wherein each optical carrier wavefront comprises:

a plurality of carrier signals, each at the frequency of the respective carrier wavefront and having a different, predetermined phase.

80. (New) The method of claim 79, wherein forming the plurality of optical carrier signals further comprises:

mixing each received initial data signal from each antenna element with a respective carrier signal from each carrier wavefront to form the plurality of optical carrier signals.

81. (New) The method of claim 80, wherein at least one of the wavelength division multiplexers comprises an array waveguide grating.

82. (New) A communication method, sequentially comprising:

receiving a plurality of RF initial data signals substantially simultaneously in each of a plurality of

antenna elements;

forming a plurality of optical carrier signals by wavelength division multiplexing all received initial data signals with each of a plurality of optical wavefronts;

dividing each of the optical carrier signals into a plurality of intermediate signals, each intermediate signal carrying all of the multiplexed initial data signals over a predetermined wavelength range;

separating each intermediate signal into the respective data signals contained therein; and

combining corresponding data signals separated from the intermediate signals into their respective initial data signals.

83. (New) The method of claim 82, wherein dividing each optical carrier signal comprises:

passing each optical carrier signal through a respective first wavelength division multiplexer to divide the optical carrier signal into the plurality of intermediate signals.

84. (New) The method of claim 83, wherein separating each intermediate signal comprises:

passing each intermediate signal through a respective second wavelength division multiplexer to separate the

intermediate signal into the respective data signals contained therein.

85. (New) The method of claim 84, wherein separating each intermediate signal further comprises:

passing each of the separated data signals to a predetermined delay line in accordance with its wavelength range.

86. (New) The method of claim 84, wherein combining corresponding data signals comprises:

combining all intermediate signals carrying the same data signal in the same wavelength range to form a single intermediate signal; and then

combining all single intermediate signals carrying the same data signal to form the respective initial data signal.

87. (New) The method of claim 86, wherein combining all intermediate signals carrying the same data signal comprises:

passing all intermediate signals carrying the same data signal through a respective third wavelength division multiplexer to combine into the respective single intermediate signal.

88. (New) The method of claim 87, wherein combining all single intermediate signals comprises:

passing all single intermediate signals carrying the same data signal through a respective fourth wavelength division multiplexer to combine into the respective initial data signal.

89. (New) The method of claim 88, wherein separating each intermediate signal further comprises:

passing each of the separated data signals to a predetermined delay line in accordance with its wavelength range.

90. (New) The method of claim 89, wherein at least one of the wavelength division multiplexers comprises an array waveguide grating.

91. (New) The method of claim 82, wherein forming the plurality of optical carrier signals further comprises:

generating one of the optical carrier wavefronts at a unique, predetermined frequency for each initial data signal received.

92. (New) The method of claim 91, wherein each optical carrier wavefront comprises:

a plurality of carrier signals, each at the frequency of the respective carrier wavefront and having a different, predetermined phase.

93. (New) The method of claim 92, wherein at least one of the wavelength division multiplexers comprises an array waveguide grating.